like manner, the eggs of most birds may be hatched by maintaining them at the proper temperature by artificial means. Some fishes are also known to build nests and to sit upon their eggs, as the sticklebacks, sun-fishes, and cat-fishes; but whether they impart heat to them or not, is doubtful.

Before entering into the details of embryonic transformations, a few words are necessary respecting the composition of the egg.

286. *Composition of the Egg.* — The egg is composed of several substances, varying in structure, as well as in appearance. Thus, in a hen's egg, (Fig. 101,) we have first a calcareous *shell*, (*s*,) lined by a double membrane, the *shell membrane*, (*m*;) then an albuminous substance, the *white*, (*a*,) in which several layers may be distinguished; within this we find the *yolk*, (*y*,) enclosed in its membrane; and before it was laid, there was in the midst of the latter a minute vesicle, the *germinative vesicle*, (Fig. 98, *g*,) containing a still smaller one, the *germinative dot*, (*d*.) These different parts are not equally important in a physiological point of view. The most conspicuous of them, namely, the shell and the white, are not essential parts, and therefore are often wanting; while the yolk, the germinative vesicle, and the germinative dot are found in the eggs of all animals; and out of these, and of these only, the germ is formed, in the position shown by Fig. 101, *e*.

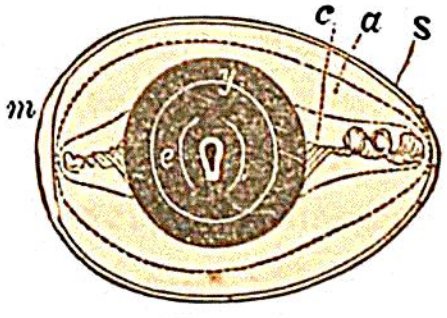

Fig. 101.

287. The *vitellus* or *yolk* (Fig. 101, *y*) is the most essential part of the egg. It is a liquid of variable consistence, sometimes opaque, as in the eggs of birds, sometimes transparent and colorless, as in the eggs of some fishes and mollusks. On examination under the microscope, it appears to be composed of an accumulation of granules and oil-drops.